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COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

(Nineteenth session,
Geneva, 2-10 December 1996)

REPORT OF THE COMMITTEE OF EXPERTS ON ITS NINETEENTH SESSION (2-10 December 1996)

ADDENDUM 2

Annex 3: Chapter 12: Recommendations on multimodal tank transport
Chapter 17: Multimodal tank-containers for refrigerated liquefied gases

Annex 4: Amendments related to the reformatting of the Recommendations into model regulations

GE.97-20526

Annex 3

Chapter 12: Recommendations on multimodal tank transport

Chapter 17: Multimodal tank-containers for refrigerated liquefied gases

The text is replaced with the text in ST/SG/AC.10/C.3/24/Add.1 with the following changes:

Paragraphs */

12.3.1 [6.6.2.2.1] Insert "or when authorized by the competent authority," after "Table 12.2".

12.3.8 [6.6.2.2.9]
12.27.7 [6.6.3.2.7]
17.3.11 [6.6.4.2.11] Delete in the first sentence: "including the effects of fatigue".

Add a new sentence to read as follows:

"The design should demonstrate that the effects of fatigue, caused by repeated application of these loads through the expected life of the portable tank have been taken into account."

12.3.13 [6.6.2.2.15] Amend to read as follows:

"Portable tanks should be capable of being electrically earthed when intended for the transport of substances meeting the flashpoint criteria of Class 3 including elevated temperature substances transported above their flashpoint. Measures should be taken to prevent dangerous electrostatic discharge.

12.3.14 [6.6.2.2.16] Add a new paragraph to read:

"**12.3.14** Portable tanks intended to contain certain dangerous substances listed in Table 12.2 of Part II should be provided with additional protection, which may take the form of additional shell thickness or a higher test pressure, the additional shell thickness or higher test pressure being determined in the light of the dangers inherent in the substances concerned, and indicated in the above-mentioned table."

12.7.1 [6.6.2.6.1] Amend the last sentence to read as follows:

"When an existing opening is closed it should be accomplished by internally and externally welding one plate to the shell."

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*/ *The paragraph number between square brackets indicates the corresponding paragraph number in the Model Regulations; see ST/SG/AC.10/23/Add.3.*

12.7.3.1.4
[6.6.2.6.3.1(a) (iv)] Amend to read as follows:

"except for portable tanks having a capacity of not more than 1,000 litres, it should be possible to close the valve from an accessible position of the portable tank that is remote from the valve itself; and"

12.11.1 [6.6.2.10.1] Delete "if allowed in Table 12.2".

17.7.2 [6.6.4.6.2] Insert the words "non-flammable" after "shells for" and the words "and hydrogen" after "liquefied gases" in the first sentence to read "shells for non-flammable refrigerated liquefied gases and hydrogen may in addition have frangible discs...".

17.8.2 [6.6.4.7.2] In the second sentence for "helium" read "non-flammable refrigerated liquefied gases (except oxygen)".

12.14.1 [6.6.2.13.1] Amend to read as follows:

Every pressure-relief device shall be plainly and permanently marked with the following:

(a) the pressure (in bar or kPa) or temperature (in °C) at which it is set to discharge;

(b) the allowable tolerance at the discharge pressure for spring-loaded devices;

(c) the reference temperature corresponding to the rated pressure for frangible discs;

(d) the allowable temperature tolerance for fusible elements; and

(e) the rated flow capacity of the device in standard cubic meters of air per second (m^3/s).

When practicable, the following information shall also be shown:

(f) the manufacturer's name and relevant catalogue number.

12.18.5 [6.6.2.17.5]
12.38.5 [6.6.3.13.5]
17.13.5 [6.6.4.12.5] Delete the word "collision" in the second sentence.

Replace the word "collision" in the first sentence with:

"damage to the shell and service equipment resulting from lateral or longitudinal impact or overturning. External fittings should be protected so as to preclude the release of the shell contents upon impact or overturning of the portable tank on its fittings"

12.18.5.4 [6.6.2.17.5(d)]
12.38.5.4 [6.6.3.13.5(d)]
17.13.5.4 [6.6.4.12.5(d)] Replace the text with the following:

"Protection of the shell against damage from impact or overturning by use of an ISO frame in accordance with ISO 1496-3:1995,"

17.13.5.5 [6.6.4.12.5.(e)] Add the following new paragraph:

"17.13.5.5 Protection of the portable tank from impact or overturning by a vacuum insulation jacket."

12.19.3 [6.6.2.19.1]
12.39.3 [6.6.3.15.1]
17.14.3 [6.6.4.14.1] Add the following references:

"Deutsche Bahn AG
Zentralbereich Technik, Minden
Portable tanks, longitudinal dynamic impact test".

"Spoornet, South Africa
Engineering Development Centre (EDC)
Testing of ISO Tank Containers
Method EDC/TES/023/000/1991-06"

12.20.1 [6.6.2.19.2]
12.40.1 [6.6.3.15.2]
17.15.1 [6.6.4.14.2] Insert before the last sentence:

"The 2.5 year inspection and test may be performed within 3 months of the specified date."

12.20.4.3 [6.6.2.19.5]
12.40.4.3 [6.6.3.15.5] Add at the end of the paragraph:

"Sheathing, thermal insulation and the like should be removed only to the extent required for reliable appraisal of the condition of the portable tank."

17.15.3 [6.6.4.14.4] Amend the beginning to read: "The 5 year and 2.5 year..."

17.15.4 [6.6.4.14.4] Add at the end of the paragraph:

"In the case of non-vacuum insulated tanks, the jacket and insulation should be removed during a 2.5 year and a 5 year periodic inspection but only to the extent necessary for a reliable appraisal."

12.20.5 [6.6.2.19.6]
12.40.5 [6.6.3.15.6]
17.15.5 [6.6.4.14.6] Amend to read as follows:

"A portable tank may not be filled and offered for transport after the date of expiry of the last 5 year or 2.5 year periodic inspection and test as required by 12.20.1/12.40.1/17.15.1. However a portable tank filled prior to the date of expiry of the last periodic inspection and test may be transported for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection. In addition, a portable tank may be transported after the date of expiry of the last periodic test and inspection:

(a) after emptying but before cleaning, for purposes of performing the next required test or inspection prior to refilling; and

(b) unless otherwise approved by the competent authority, for a period not to exceed six months beyond the date of expiry of the last periodic test or inspection, in order to allow the return of dangerous goods for proper disposal or recycling. Reference to this exemption should be mentioned in the transport document."

12.23.1 [6.6.2.20.1]
12.43.1 [6.6.3.16.1] Insert between the lines for "MAWP" and "Water capacity" the following new line:

"External design pressure _____ bar/kPa gauge"

12.24.1 [4.2.1.2]
12.44.2 [4.2.2.3]
17.19.3 [4.2.3.3] Replace the first sentence by the following:

"During transport, portable tanks should be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning."

12.30.4 [6.6.3.5.4] Amend to read as follows:

"For filling and discharge bottom openings of portable tanks intended for the transport of flammable and/or toxic non-refrigerated liquefied gases the internal stop-valve should be a quick closing safety device which closes automatically in the event of unintended movement of the portable tank

during filling or discharge or fire engulfment. Except for portable tanks having a capacity of not more than 1,000 litres, it should be possible to operate this device by remote control."

12.32.4 [6.6.3.7.4] Insert a new paragraph:

"In the case of multi-purpose portable tanks, the pressure-relief devices should open at a pressure indicated in 12.32.1 for the gas having the highest maximum allowable pressure of the gases allowed to be transported in the portable tank."

12.33.1 [6.6.3.8.1] Add at the end of the paragraph:

"In the case of multi-purpose tanks, the combined delivery capacity of the pressure-relief devices should be taken for the gas which requires the highest delivery capacity of the gases allowed to be transported in the portable tank."

12.34.4 [6.6.3.9.1]
17.9.1 [6.6.4.8.1] Amend to read as follows:

"Every pressure-relief device shall be plainly and permanently marked with the following:

(a) the pressure (in bar or kPa) at which it is set to discharge;

(b) the allowable tolerance at the discharge pressure for spring-loaded devices;

(c) the reference temperature corresponding to the rated pressure for frangible discs; and

(d) the rated flow capacity of the device in standard cubic meters of air per second (m^3/s).

When practicable, the following information shall also be shown:

(f) the manufacturer's name and relevant catalogue number."

12.43.2 [6.6.3.16.2] Amend the second marking to read:

"Name of non-refrigerated liquefied gas(es) permitted for transport"

12.558 [4.2.1.13.8] Amend to read as follows:

"The emergency-relief devices may be of the spring-loaded or frangible types designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of complete fire-engulfment as calculated by the following formulae:

$$q = 70961 \; F \; A^{0.82}$$

where:

q = heat absorption (W)
A = wetted area [m^2]
F = insulation factor [-];
F = 1 for non-insulated vessels, or

$$F = \frac{U \; (923 - T_{PO})}{47032}$$ for insulated vessels

where:

K =	heat conductivity of insulation layer	[$W.m^{-1}.K^{-1}$]
L =	thickness of insulation layer	[m]
U =	K/L = heat transfer coefficient of the insulation	[$W.m^{-2}.K^{-1}$]
T_{PO}=	temperature of peroxide at relieving conditions	[K]

The start-to-discharge pressure of the emergency-relief device(s) should be higher than that specified in 12.557 and based on the results of the tests referred to in 12.551. The emergency-relief devices should be dimensioned in such a way that the maximum pressure in the tank never exceeds the test pressure of the tank.

NOTE : *An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.*"

Annex 4

Amendments related to the reformatting of the Recommendations into model regulations

The Recommendations on the Transport of Dangerous Goods are reformatted as follows:

RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS

INTRODUCTION AND PURPOSE

Text of ST/SG/AC.10/R.505 with the following amendments:

Paragraphs 1. Delete the square brackets in the last sentence.

2. For "which are presented at annex" read "which are presented as annex".

Figure 1 Amend to read as follows:

Figure 1

DATA SHEET TO BE SUBMITTED TO THE UNITED NATIONS FOR NEW OR AMENDED CLASSIFICATION OF SUBSTANCES

Submitted by . . . . . Date . . . . . .

Supply all relevant information including sources of basic classification data. Data shall relate to the product in the form to be transported. State test methods. Answer all questions - if necessary state "not known" or "not applicable" - If data is not available in the form requested, provide what is available with details. Delete inappropriate words.

Section 1. SUBSTANCE IDENTITY

1.1 Chemical name . . . . . .

1.2 Chemical formula . . . . . .

1.3 Other names/synonyms . . . . . .

1.4.1 UN number 1.4.2 CAS number . . . . . .

1.5 Proposed classification for the Recommendations . . . . . .

1.5.1 proper shipping name (3.1.2 */) . . . . . .

1.5.2 class/division . . . . . subsidiary risk(s) . . . . . .

packing group . . . . . .

1.5.3 proposed special provisions, if any . . . . . .

1.5.4 proposed packing method . . . . . .

Section 2. PHYSICAL PROPERTIES

2.1 Melting point or range . . . . . °C

2.2 Boiling point or range . . . . . °C

2.3 Relative density at :

2.3.1 15 °C . . . . . .

2.3.2 20 °C . . . . . .

2.3.3 50 °C . . . . . .

---

*/ *This and similar references are to chapters and paragraphs in the Model Regulations on the Transport of Dangerous Goods.*

2.4 Vapour pressure at :

2.4.1 50 °C ..... kPa

2.4.2 65 °C ..... kPa

2.5 Viscosity at 20 °C **/ ..... m^2/s

2.6 Solubility in water at 20 °C ..... g/100 ml

2.7 Physical state at 20 °C (2.2.1.2 */) solid/liquid/gas **/

2.8 Appearance at normal carriage temperatures, including colour and odour .....
.....

2.9 Other relevant physical properties .....
.....

Section 3. FLAMMABILITY

3.1 Flammable vapour

3.1.1 Flashpoint (2.3.3 */) ..... °C oc/cc

3.1.2 Is combustion sustained? (2.3.1.2*/) yes/no

3.2 Autoignition temperature ..... °C

3.3 Flammability range (LEL/UEL) ..... %

3.4 Is the substance a flammable solid ? (2.4.2 */)

3.4.1 If yes, give details .....
.....
.....

---

*/ *This and similar references are to chapters and paragraphs in the Model Regulations on the Transport of Dangerous Goods.*

**/ *See definition of "liquid" in 1.2.1 of the Model Regulations on the Transport of Dangerous Goods.*

Section 4. CHEMICAL PROPERTIES

4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity ? yes/no

If yes, state

4.1.1 Inhibitor/stabilizer used .....

4.1.2 Alternative method .....

4.1.3 Time effective at 55 °C .....

4.1.4 Conditions rendering it ineffective .....

4.2 Is the substance an explosive according to paragraph 2.1.1.1 ? (2.1 */) yes/no

4.2.1 If yes, give details .....

.....

.....

4.3 Is the substance a desensitized explosive ? (2.4.2.4 */) yes/no

4.3.1 If yes, give details .....

.....

.....

4.4 Is the substance a self-reactive substance ? (2.4.1 */) yes/no

If yes state

4.4.1 exit box of flow chart .....

What is the self accelerating decomposition temperature (SADT) for a 50 kg package ? ..... °C

Is temperature control required ? (2.4.2.3.5 */) yes/no

4.4.2 proposed control temperature for a 50 kg package ..... °C

4.4.3 proposed emergency temperature for a 50 kg package ..... °C

4.5 Is the substance pyrophoric ? (2.4.3 */) yes/no

4.5.1 If yes, give details .....

.....

.....

---

*/ *This and similar references are to chapters and paragraphs in the Model Regulations on the Transport of Dangerous Goods.*

4.6 Is the substance liable to self-heating (2.4.3 */) yes/no

4.6.1 If yes, give details .....
.....

4.7 Is the substance an organic peroxide ? (2.5.1 */) yes/no

If yes state

4.7.1 exit box of flow chart .....

What is the self-accelerating decomposition temperature (SADT) for a 50 kg package ?..... °C

Is temperature control required ? (2.5.3.5.1 */) yes/no

4.7.2 proposed control temperature for a 50 kg package ..... °C

4.7.3 proposed emergency temperature for a 50 kg package ..... °C

4.8 Does the substance in contact with water emit flammable gases ? (2.4.4 */) yes/no

4.8.1 If yes, give details .....
.....
.....

4.9 Does the substance have oxidizing properties (2.5.1 */) yes/no

4.9.1 If yes, give details .....
.....
.....

4.10 Corrosivity (2.8 */) to :

4.10.1 mild steel ..... mm/year at .... °C

4.10.2 aluminium ..... mm/year at .... °C

4.10.3 other packaging materials
(specify) .... mm/year at .... °C
.... mm/year at .... °C

4.11 Other relevant chemical properties
.....
.....
.....

---

*/ *This and similar references are to chapters and paragraphs in the Model Regulations on the Transport of Dangerous Goods.*

Section 5. HARMFUL BIOLOGICAL EFFECTS

5.1 LD 50, oral (2.6.2.1.1 */) ..... mg/kg Animal species .....

5.2 LD 50, dermal (2.6.2.1.2 */) ..... mg/kg Animal species .....

5.3 LC 50, inhalation (2.6.2.1.3 */) ..... mg/litre Exposure time ..... hours

or ..... ml/m^3 Animal species .....

5.4 Saturated vapour concentration at 20 °C (2.6.2.2.4.3 */) ..... ml/m^3

5.5 Skin exposure (2.8 */) results Exposure time ..... hours/minutes

Animal species .....

5.6 Other data .....

.....

5.7 Human experience .....

.....

Section 6. SUPPLEMENTARY INFORMATION

6.1 Recommended emergency action

6.1.1 Fire (include suitable and unsuitable extinguishing agents) .....

.....

6.1.2 Spillage .....

6.2 Is it proposed to transport the substance in :

6.2.1 Intermediate Bulk Containers (7.5*/) ? yes/no

6.2.2 Multimodal tanks (7.5*/) ? yes/no

If yes, give details in Sections 7 and/or 8.

Section 7. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 2.6.2.1.1)

7.1 Proposed type(s) .....

Section 8. MULTIMODAL TANK TRANSPORT (only complete if yes in 2.6.2.1.2)

8.1 Description of proposed tank (including IMO tank type if known) .....

.....

8.2 Minimum test pressure .....

---

*/ *This and similar references are to chapters and paragraphs in the Model Regulations on the Transport of Dangerous Goods.*

8.3 Minimum shell thickness .....

8.4 Details of bottom openings, if any .....

8.5 Pressure relief arrangements .....

8.6 Degree of filling .....

8.7 Unsuitable construction materials .....

ANNEX: MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Notes on the structure of the Model Regulations

Text of ST/SG/AC.10/R.505 with the following amendment:

Delete the square brackets in the third paragraph.

TABLE OF CONTENTS

Text of ST/SG/AC.10/R.505 with the following amendments:

Part 6 is renumbered Part 7, and Part 7 is renumbered Part 6.

Renumber consequently all chapters and all paragraphs of Part 6 and Part 7, as well as references thereto.

PART 1

Text of ST/SG/AC.10/R.505, with the following amendments:

Chapter 1.1

1.1.1.2 Amend Note 1 to read as follows:

"***Note 1:*** *Specific modal provisions for the transport of dangerous goods as well as derogations from these general requirements can be found in the modal regulations.*"

1.1.1.3 Delete the square brackets and for "Certains" read "Certain".

1.1.2 Replace this section by the following new section:

"**1.1.2 Transport of radioactive material**

1.1.2.1 Regulations regarding the transport of radioactive material have been prepared by the International Atomic Energy Agency (IAEA) in consultation with the United Nations specialized agencies concerned and the IAEA's Member States. The most recent publication of the IAEA Regulations was published in 1996 (Regulations for the Safe Transport of Radioactive Material, (1996 Edition), IAEA Safety Standards Series No.ST-1).

1.1.2.2 The IAEA Regulations are concerned only with the radioactive and fissile properties of materials; it is necessary however, for consignments of radioactive material to comply with transport regulations applicable to other hazardous properties which such material may possess. This is specified in the IAEA Regulations in paragraphs 109 and 507.

1.1.2.3 In practice packages containing radioactive material consisting of one or more radio-nuclides, when transported in accordance with the IAEA Regulations will normally be satisfactorily covered in respect of any other hazardous properties possessed by the contents. Thus is the case both when the radioactive material is in isolation and, as is common, when it is associated with small quantities of non-radioactive material.

1.1.2.4 However, it is emphasized that radioactive material transported in accordance with those Regulations may be associated with a comparatively large quantity of a non-radioactive material (particularly a liquid or a gas) which may possess other hazardous properties requiring additional consideration in that respect. This shall be borne in mind particularly for the following radioactive material:

(a) Limited quantities of radioactive material in excepted packages, complying with paragraphs 408 to 410; 515 to 520 and 620 of the IAEA Regulations;

(b) The low specific activity materials as defined in para. 226 of the IAEA Regulations; and

(c) The surface contaminated objects as defined in paragraph 241 of the IAEA Regulations.

1.1.2.5 General principles for radiation protection of transport workers and the general public are included in Section III of the IAEA Regulations paragraphs 301 to 307. Compliance with the IAEA Regulations, which utilize the principles set forth in "International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources"(1996 Edition), IAEA Safety Series No. 115, will ensure a high degree of safety."

Chapter 1.2

1.2.1 In the definition of "reconditioned packagings"

(b) (I) Delete at the end ", and durable markings".

(b) (iii) Add at the end "or other significant defects".

Add the following extra definition:
"*Solids* are dangerous goods, other than gases, that do not meet the definition of *Liquids* in this paragraph."

1.2.2.6 To be deleted.

PART 2

Text of ST/SG/AC.10/R.505/Add.1 with the following amendments:

Chapter 2.0

2.0.2.7 Insert the same text of paragraph 3.1.3.3 and delete "where mentioned" from the text in parenthesis.

Renumber 2.0.2.7 as 2.0.2.8.

Chapter 2.3

2.3.2.3 Add a new paragraph as follows:

"2.3.2.3 Viscous flammable liquids such as points, enamels, varnishes, adhesives and polishes with a flashpoint of less than 23 °C are included in Packing Group III provided that:

(a) less than 3 % of the clear solvent layer separates in the solvent separation test;

(b) the mixture does not contain any substances with a primary or a subsidiary risk of division 6.1 or class 8."

Renumber paragraphs 2.3.2.3 to 2.3.2.5 as 2.3.2.4 to 2.3.2.6.

Chapter 2.4

Figure 2.1 To be inserted.

2.4.2.3.5.2 Add the following new paragraph:

"2.4.2.3.5.2 Diluents which may allow a self-reactive substance to concentrate to a dangerous extent in the event of leakage from a package shall not be used."

2.4.2.4 Add a new second sentence to this paragraph as follows:

"Such entries in the List of Dangerous Goods are: UN Nos. 1310, 1320, 1321, 1322, 1336, 1337, 1344, 1347, 1348, 1349, 1354, 1355, 1356, 1357, 1517, 1571, 2555, 2556, 2852, 2907, 3270 and 3319."

Chapter 2.5

2.5.3.2.4 Include in the table the following organic peroxide:

	"Concentration (%)	Diluent type A (%)	Packing Method	Control temperature (°C)	Emergency temperature	Number (Generic entry)
ISOPROPYL sec-BUTYL PEROXYDICARBONATE + DI-sec-BUTYL PEROXYDICARBONATE + DI-ISOPROPYL PEROXYDICARBONATE"	≤ 32 + ≤15-18 + ≤12- 15	≥ 38	OP7	-20°C	-10°C	3115

Figure 2.2 To be inserted after 2.5.3.3.2 (g).

Chapter 2.6

2.6.1 (b) Replace the existing text by the following:

"(b) Division 6.2 *Infectious substances*

These are substances known or reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites, fungi) or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans."

2.6.2.2.4.1 Delete the current footnote (a) to the table and renumber the remaining footnote (b) as footnote (a).

Figure 2.3 To be inserted after 2.6.2.2.4.3.

2.6.2.4.2 Add the following note to the end of this paragraph:

"***Note:*** *LD50 toxicity data for a number of common pesticides may be obtained from the most current edition of the document "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification" available from the International Programme on Chemical Safety, World Health Organisation (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD50 data for pesticides, its classification system shall not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which shall be in accordance with this Model Regulation.*"

2.6.2.4.3 Amend to read as follows:

"2.6.2.4.3 The proper shipping name used in the transport of the pesticide shall be selected on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit."

2.6.2.4.4 Delete the list of common pesticides with corresponding UN numbers.

2.6.3.1.1 Replace the existing text by the following:

"2.6.3.1.1 Infectious substances are those substances known or reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites, fungi) or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans.

Note 1: *However, they are not subject to the regulations for this division if they are unlikely to cause human or animal disease.*

Note 2: *Infectious substances are subject to the regulations for this division only if they are capable of spreading disease when exposure to them occurs.*"

2.6.3.3.1 For "2.6.3.1.2(b)" read "2.6.3.1.2(a) and (b)".

2.6.3.3.2 (d) Replace the existing text by the following:

"(d) the packaging includes:

(i) an inner packaging comprising:

- watertight primary receptacle(s);
- a watertight secondary packaging;
- absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if several primary receptacles are placed in a single secondary packaging, they shall be individually wrapped so as to prevent contact between them.

(ii) an outer packaging of adequate strength for its capacity, mass and intended use, and with a minimum external dimension of 100 mm."

2.6.3.3.3 Replace the existing text by the following:

"2.6.3.3.3 Waste clinical or (bio)medical substances shall meet all the requirements for infectious substances except the packaging requirements of packing instruction 620 and 7.1.5."

Chapter 2.7

Amend Chapter 2.7 to read as follows:

"**CHAPTER 2.7**

CLASS 7 - RADIOACTIVE MATERIAL

2.7.1 Definition

Class 7 material (radioactive material) shall mean any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in paragraphs 401-406 of the Regulations for the Safe Transport of Radioactive Material, (1996 Edition) IAEA Safety Standards Series No.ST-1."

PART 3

Chapter 3.1

Text of ST/SG/AC.10/R.505/Add.2 with the following amendments:

3.1.2.6.1.1 For "other name(s) in 2.6.2.4.4", read "other name(s) in the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification."

3.1.3.2 Replace the single quotes by double quotes.

3.1.3.3 Delete "where mentioned" from the text in parenthesis.

Chapter 3.2

DANGEROUS GOODS LIST

Text of ST/SG/AC.10/R.505/Add.3 with the following amendments:

1. Insert the following amendments:

Insert special provision "279" in column (6) for the following entries of Class 6.1:

UN 1230, UN 1547, UN 1577, UN 1578, UN 1590, UN 1591, UN 1661, UN 1662, UN 1663, UN 1671, UN 1673, UN 1708, UN 2023, UN 2078, UN 2311, UN 2432, UN 2474, UN 2512, UN 2730.

Replace the figure by "NONE" in column (7) for the following entries:
UN 3064
UN 1418, UN 1436, UN 3100, UN 3124, UN 3135, UN 3209 and UN 3301.
UN 1724, UN 2434, UN 2437 and UN 2987.
UN 1701, UN 1737, UN 1738 and UN 1697
UN 1569, UN 1810, UN 1838, UN 2442 and UN 2826.

Insert "21" in column (11) (Portable tanks special provisions) for the following entries:
UN 1791, UN 1908, UN 2014, UN 2015, UN 2984 and UN 3149.

UN 0004 to UN 0500 — Delete packing group "II" in column (5) for all entries of Class 1.

UN 0190 — Delete "None" in column (3).

UN 1191 — Amend the name in column (2) to read as follows:
"OCTYL ALDEHYDES"

UN 1327 — Amend the name in column (2) to read as follows:
"HAY, STRAW or BHUSA"
Replace special provision "76" with special provision "281" in column (6), and delete packing group "III" in column (5).

UN 1347 — Delete "2" in column (6).

UN 1364 — Delete special provision "34" in column (6).

UN 1391 — Add special provision "282" in column (6).

UN 1477 — Add special provision "223" in column (6) for packing group III.

UN 1660 — Delete packing group "II" in column (5).

UN 1790 — Amend the first name for packing group I in column (2) to read as follows:
"HYDROFLUORIC ACID, solution with more than 60% hydrofluoric acid
Add a second name for packing group II in column (2) to read as follows:
"HYDROFLUORIC ACID, solution, with not more than 40% hydrofluoric acid"

UN 1796 — Add a second name for packing group II in column (2) to read as follows:
"NITRATING ACID MIXTURE with not more than 50% nitric acid"
Delete special provision "53" (twice) in column (6) and add subsidiary risk "5.1" in column (4) for packing group I.

UN 1826 — Add a second name for packing group II in column (2) to read as follows:
"NITRATING ACID MIXTURE, SPENT, with not more than 50% nitric acid"
Delete special provision "53" (twice) in column (6) and add subsidiary risk "5.1" in column (4) for packing group I.

UN 1921	Add subsidiary risk "6.1" in column (4).
UN 1950	Delete special provision "197" in column (6).
UN 2031	Add a second name for packing group II in column (2) to read as follows: "NITRIC ACID, other than red fuming, with not more than 70% nitric acid" Delete two times special provision "68" in column (6) and add subsidiary risk "6.1" in column (4) for packing group I.
UN 2351	Delete the second UN number in column (1) and the second name in column (2).
UN 2771	Amend the name in column (2) to read as follows: "THIOCARBAMATE PESTICIDE, SOLID, TOXIC"
UN 2772	Amend the name in column (2) to read as follows: "THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23°C"
UN 2790	Add new special provision "275" in column (6) and delete packing group "II" in column (5).
UN 2814	Insert packing instruction "620" in column (8).
UN 2862	Replace packing group "II" with "III" in column (5).
UN 2900	Insert packing instruction "620" in column (8).
UN 2912	Amend the name in column (2) as follows: "RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile excepted"
UN 2984	Delete special provision "65" in column (6).
UN 3005	Amend the name in column (2) as follows: "THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23°C"
UN 3006	Amend the name in column (2) as follows: "THIOCARBAMATE PESTICIDE, LIQUID, TOXIC"
UN 3015	Add special provisions "223" and "274" in column (6) for packing group III.
UN 3020	Add special provisions "223" and "274" in column (6) for packing group III.

UN 3065	Add a second name and description as follows: "ALCOHOLIC BEVERAGES, with more than 24% but not more than 70% alcohol by volume"
UN 3065	Add a second name and description as follows: "ALCOHOLIC BEVERAGES, with more than 24% but not more than 70 % alcohol by volume". Replace special provision "145" by "146" in column (6) for packing group II.
UN 3101 to UN 3120	Delete packing group "II" in column (5).
UN 3109	Add packing instruction "521" in column (8).
UN 3119	Add packing instruction "521" in column (8).
UN 3164	Add special provision "283" in column (6).
UN 3166	Delete special provision "117" in column (6).
UN 3171	Amend the name in column (2) as follows: "BATTERY-POWERED VEHICLE or BATTERY-POWERED EQUIPMENT"
UN 3221 to UN 3240	Delete packing group "II" in column (5) and replace packing instruction "410" by "520" in column (8).
UN 3268	Amend the name in column (2) to read: "AIR BAG INFLATORS, pyrotechnic or AIR BAG MODULES, pyrotechnic or SEAT-BELT PRETENSIONERS, pyrotechnic" Add special provision "280" in column (6).
UN 3291	Add packing instruction "621" in column (8).
UN 3334	Amend the name in column (2) to read: "AVIATION REGULATED LIQUID, N.O.S." Add special provision "274" in column (6).
UN 3335	3335 Amend the name in column (2) to read: "AVIATION REGULATED SOLID, N.O.S." Add special provision "274" in column (6).

2. **Amend the references of portable tank instructions in column 10 as follows:**

OLD	NEW
T1	T1
T2	T2
T3	T2
T4	T2
T5	T3
T6	T4
T7	T4
T8	T4
T9	T5
T10	T5
T11	T6
T12	T6
T13	T7
T14	T7
T15	T8
T16	T9
T17	T10
T18	T10
T19	T11
T20	T11
T21	T12
T22	T13
T23	T13
T24	T14
T25	T14
T26	T34
T27	T15
T28	T16
T29	T17
T30	T18
T31	T19
T32	T19
T33	T20
T34	T20
T35	T21
T36	T22
T37	T23
T38	T24
T39	T24
T40	T25
T41	T26
T42	T27
T43	T28
T44	T29
T45	T30
T46	T31
T47	T32
T48	T50
T49	T75

3. **Amend the references of portable tank special provisions in column 11 as follows:**

Replace references 1 to 4 by references TP6 to TP9 respectively.

Replace references 6 to 20 by references TP10 to TP24.

Insert special provisions:

TP1 for all substances which are assigned provision 12.22.2 in column 9 of the existing table 12.2.

TP2 for all substances which are assigned provision 12.22.3 in column 9 of the existing table 12.2.

TP3 for all substances which are assigned provision 12.22.5 in column 9 of the existing table 12.2.

TP4 for all substances which are assigned provision 12.703 in column 9 of the existing table 12.2.

4. Add new entries as follows:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2344	BROMOPROPANES	3			184	IL
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1			61 109 274	
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 °C	3	6.1		61 109 274	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23°C	6.1	3		61 109 274	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC,	6.1			61 109 274	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1			61 109 274	
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 °C	3	6.1		61 109 274	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 °C	6.1	3		61 109 274	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1			61 109 274	
3353	AIR BAG INFLATORS, COMPRESSED GAS or AIR BAG MODULES, COMPRESSED GAS or SEAT-BELT PRETENSIONERS, COMPRESSED GAS	2.2			280	
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.	2.1			109 274	
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1		109 274	
3356	OXYGEN GENERATOR, CHEMICAL	5.1		II	284	

5. Delete the following entries:

UN 2767, UN 2768, UN 3001, UN 3002, UN 2773, UN 2774, UN 3007, UN 3008, UN 2769, UN 2770, UN 3003, UN 3004, UN 2765, UN 2766, UN 2999, UN 3000

Chapter 3.3

Text of ST/SG/AC.10/R.505/Add.2 with the following amendments:

1. Insert the following amendments:

3.3.1 Renumber special provisions "253 to 262" as "265 to 274".

Renumber special provisions "263 to 265" as "276 to 278".

34 To be deleted.

43 Amend to read as follows:

"43 When offered for carriage as pesticides, these substances shall be carried under the relevant pesticide entry and in accordance with the relevant pesticide provisions (see 2.6.2.3 and 2.6.2.4)."

61 Amend to read as follows:

"61 The technical name which shall supplement the proper shipping name shall be the ISO common name, other name listed in the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification" or the name of the active substances. (see also 3.1.2.6.2.1)".

68 To be deleted.

174 To be deleted.

197 To be deleted.

215 Replace "(I) and (ii)" by "(a) and (b)" in the last paragraph.

239 Insert at the beginning: "Except for air transport..."
After "vehicles" add "(UN 3171)".

240 Add "or sodium batteries" after "powered by wet batteries".

276 Remove the square brackets and amend to read as follows:

"276 This includes any substance which is not covered by any of the other classes but which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties."

2. Add new special provisions as follows:

"279 The substance is assigned to this classification or packing group based on human experience rather than the strict application of classification criteria set out in these Model Regulations.

280 This entry applies to articles which are used as life saving vehicle air bag inflators or air bag modules or seat-belt pretensioners, containing a gas or a mixture of compressed gases classified under Division 2.2 and with or without small quantities of pyrotechnic material. For units with pyrotechnic material, initiated explosive effects shall be contained within the pressure vessel such that the unit may be excluded from Class 1 in accordance with 2.1.1.1(b), in conjunction with 16.6.1.4.7(a)(ii) of the Manual of Test and Criteria, Part 1. In addition, units shall be designed or packaged for transport so that when engulfed in a fire there will be no fragmentation of the pressure vessel or projection hazard. This shall be determined by analysis.

The pressure vessel shall be in compliance with the requirements for the gas(es), contained in the pressure vessel.

Air bags or seat-belts installed in vehicles or in completed vehicle components such as steering columns, door panels, seats etc. are not subject to these Model Regulations.

281 The transport by sea of hay, straw or bhusa, wet, damp or contamined with oil shall be prohibited. Transport by other modes is also prohibited except with special authorization by the competent authorities.
Hay, straw and bhusa, when not wet, damp or contaminated with oil, are subject to these Model Regulations only when transported by sea.

282 Suspensions with a flashpoint of not more than 60.5 °C, shall bear a flammable liquid subsidiary risk label.

283 Articles intended to function as shock absorbers are not subject to this Model Regulation provided each article:

(a) has a gas space capacity not exceeding 1 litre and a charge pressure not exceeding 50 bar;

(b) has a minimum burst pressure of 4 times the charge pressure at 20°C;

(c) is manufactured from material which will not fragment upon rupture;

(d) when subjected to fire, is protected from rupture by means of a fire degradable seal or a pressure-relief device to relieve internal pressure; and

(e) is manufactured in accordance with a quality assurance standard acceptable to the competent authority.

284 An oxygen generator, chemical, containing oxidizing substances shall meet the following conditions:

(a) the generator when containing an explosive actuating device shall only be transported under this entry when excluded from Class 1 in accordance with paragraph 2.2.1.3 of these Model Regulations;

(b) in addition to the requirements of Packing Group II applicable to the package, the generator, without its packaging, shall be capable of withstanding a 1.8 m drop test onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause damage, without loss of its contents and without actuation;

(c) when a generator is equipped with an actuating device, it shall have at least two positive means of preventing unintentional actuation; and

(d) the generator(s) shall be transported in a package which will meet the following requirements when one generator in the package is actuated:

(I) other generators in the package will not be actuated;

(ii) packaging material will not ignite; and

(iii) the outside surface temperature of the completed package shall not exceed 100°C.

285 Schedules of requirements for the transport of specified types of radioactive material consignments are included in the Regulations for the Safe Transport of Radioactive Material, (1996 Edition), IAEA Safety Standards Series No. ST-1. They provide a summary of the main provisions, with references being provided to the relevant detailed provisions of the IAEA Regulations. The relationship between the UN number and the IAEA schedule is given in the table below:

UN NUMBER	IAEA SCHEDULES
2908	4
2909	3
2910	1
2911	2
2912	5
2913	8
2915	9
2916	10
2917	11
2919	14
2977	(6+13) or (7+13) or (9+13)
2978	5 or 6 or 7 or 9
3321	6
3322	7
3323	12
3324	6 + 13
3325	7 + 13
3326	8 + 13
3327	9 + 13
3328	10 + 13
3329	11 + 13
3330	12 + 13
3331	14 + 13
3332	9
3333	9 + 13

PART 4

Text of ST/SG/AC.10/R.505/Add.4 with the following amendments:

Chapter 4.1

Introductory notes: (unchanged)

The text of this chapter is rearranged as follows:

4.1.1	**General provisions for the packing of dangerous goods, other than goods of Classes 2 or 7 or Division 6.2**
4.1.1.1	(unchanged)
4.1.1.2	Add a new last sentence to read: "Where necessary, they shall be provided with a suitable inner coating or treatment."
4.1.1.3 to 4.1.1.14	(unchanged)
4.1.1.15	To be moved under Packing Instruction for Class 1. Amend *"Note 1"* to read *"Note"*.
4.1.1.16 to 4.1.1.16.2	To be renumbered 4.1.1.15 to 4.1.1.15.2
4.1.2	**General provisions for the use of IBCs**
4.1.2.1 to 4.1.2.9	Text of 4.1.3.1 to 4.1.3.9
4.1.2.10	(old 4.1.3.10) Amend to read as follows: "4.1.2.10 The periodic testing and inspection requirements for IBCs are provided in Chapter 7.5. An IBC shall not be filled and offered for transport after the date of expiry of the last periodic test required by 7.5.4.14.3, or the date of expiry of the last periodic inspection required by 7.5.1.6.4.

However, an IBC filled prior to the date of expiry of the last periodic test or inspection may be transported for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection.

In addition, an IBC may be transported after the date of expiry of the last periodic test or inspection:

(a) After emptying but before cleaning, for purposes of performing the required test or inspection prior to refilling; and

(b) Unless otherwise approved by the competent authority, for a period not to exceed six months beyond the date of expiry of the last periodic test or inspection in order to allow the return of dangerous goods for proper disposal or recycling."

4.1.2.11 Text of section 4.1.3.12 (Additional general provisions for the use of rigid plastics and composite IBCs for liquids).

Delete 4.1.3.11.

4.1.3 Special packing provisions for goods of Class 1

4.1.3.1 The general provisions of 4.1.1 shall be met.

4.1.3.2 and 4.1.3.3 Text of 4.1.1.15.1 and 4.1.1.15.2

4.1.3.4 Text of 4.1.1.15.3, but delete the letter "(a)" before the first sub-paragraph and delete sub-paragraph (b).

The reference to 4.1.4 should be replaced by a reference to 4.1.3.19.

4.1.3.5 Text of 4.1.1.15.4, but replace the word "Packages" by "Packagings" and insert the words "for Packing Group II" after "7.1.5".

4.1.3.6 to 4.1.3.18 Text of 4.1.1.15.5 to 4.1.15.17.

4.1.3.19 Text of 4.1.4.3 (Packing Instructions 101 to 144: unchanged).

4.1.4 Special packing provisions for Class 2

(Reserved)

4.1.5 Add new text as follows:

"4.1.5 Special packing provisions for organic peroxides (Division 5.2) and self-reactive substances of Division 4.1

4.1.5.1 Use of packagings

4.1.5.1.1 Packagings for organic peroxides and self-reactive substances shall meet the requirements of Chapter 7.1 at the Packing Group II performance level [to avoid unnecessary confinement, metal packaging meeting the test criteria of Packing Group I shall not be used].

4.1.5.1.2 The packing methods for organic peroxides and self-reactive substances are listed in Packing Instruction 520 and are designated OP1 to OP8. The quantities specified for each packing method are the maximum quantities authorized per package.

4.1.5.1.3 The packing method appropriate for the individual currently assigned organic peroxides and self-reactive substances are listed in 2.5.3.2.4.

4.1.5.1.4 For new organic peroxides, new self-reactive substances or new formulations of currently assigned organic peroxides or self-reactive substances, the following procedure shall be used to assign the appropriate packing method:

(a) ORGANIC PEROXIDE TYPE B OR SELF-REACTIVE SUBSTANCE TYPE B:

Packing method OP5 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 2.5.3.3.2(b) (resp. 2.4.2.3.3.2(b)) in a packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP5 (viz. one of the packagings listed for OP1 to OP4), then the corresponding packing method with the lower OP number is assigned.

(b) ORGANIC PEROXIDE TYPE C OR SELF-REACTIVE SUBSTANCE TYPE C:

Packing method OP6 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 2.5.3.3.2(c) (resp. 2.4.2.3.3.2(c)) in packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP6 then the corresponding packing method with the lower OP number is assigned.

(c) ORGANIC PEROXIDE TYPE D OR SELF-REACTIVE SUBSTANCE TYPE D:

Packing method OP7 shall be assigned to this type of organic peroxide or self-reactive substance.

(d) ORGANIC PEROXIDE TYPE E OR SELF-REACTIVE SUBSTANCE TYPE E:

Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance.

(e) ORGANIC PEROXIDE TYPE F OR SELF-REACTIVE SUBSTANCE TYPE F:

Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance.

4.1.5.2 *Use of intermediate bulk containers*

4.1.5.2.1 The currently assigned organic peroxides specifically listed in 2.5.3.2.4 and indicated with the letter "N" in the "Packing Method" column of that table may be transported in IBCs in accordance with Packing Instruction 521.

4.1.5.2.2 Other organic peroxides and self-reactive substances of type F may be transported in IBCs under conditions established by the competent authority of the country of origin when, on the basis of the appropriate tests, that competent authority is satisfied that such transport may be safely conducted. The tests undertaken shall include those necessary:

(a) to prove that the organic peroxide (or self-reactive substance) complies with the principles for classification given in 2.5.3.3.2(f), exit box F of Figure 2.2; (resp. 2.4.2.3.3.2 (f), exit box F of Figure 2.1);

(b) to prove the compatibility of all materials normally in contact with the substance during the transport;

(c) to determine, when applicable, the control and emergency temperatures associated with the transport of the product in the IBC concerned as derived from the SADT;

(d) to design, when applicable, pressure and emergency relief devices;

(e) to determine if any special provisions are necessary for safe transport of the substance.

4.1.5.3 Packing instructions for organic peroxides (Division 5.2) and self-reactive substances of Division 4.1:

520	PACKING INSTRUCTION	520
Combination packagings		**Single packagings**
Boxes		***Drums***
aluminium (4B)		***aluminium (1B1, 1B2)***
expanded plastic (4H1)		***fibre (1G)***
fibreboard (4G)		***plastics (1H1, 1H2)***
natural wood (4C1, 4C2)		***plywood (1D)***
plywood (4D)		***steel (1A1, 1A2)***
reconstituted wood (4F)		***Jerricans***
solid plastics (4H2)		***aluminium (3B1, 3B2)***
steel (4A)		***plastics (3H1, 3H2)***
Drums		***steel (3A1, 3A2)***
aluminium (1B2)		
fibre (1G)		***Composite packagings with plastics inner***
plastics (1H2)		***receptacles (6HA1, 6HA2, 6HB1, 6HB2, 6HC,***
plywood (1D)		***6HD1, 6HD2, 6HG1, 6HG2, 6HH1, 6HH2)***
steel (1A2)		
Jerricans		
aluminium (3B2)		
plastics (3H2)		
steel (3H2)		
		(continued on next page)

Maximum quantity per packaging/package 1/ for packing methods OP 1 to OP 8								
Packing method *Maximum Quantity*	*OP 1*	*OP 2 1/*	*OP 3*	*OP 4 1/*	*OP 5*	*OP 6*	*OP 7*	*OP 8*
Maximum mass (kg) for solids and for combination packagings (liquid and solid)	*0.5*	*0.5/10*	*5*	*5/25*	*25*	*50*	*50*	*200 2/*
Maximum contents in litres for liquids 3/	*0.5*	-	*5*	-	*30*	*60*	*60*	*225 4/*

1/ If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.

2/ 60 kg for jerricans
100 kg for boxes.

3/ Viscous liquids shall be treated as solids when they do not meet the criteria provided in the definition for "liquids" presented in 1.2.1.

4/ 60 litres for jerricans.

The general packing provisions of Chapter 4.1 shall be met.

PARTICULAR PACKING PROVISIONS OR EXCEPTIONS:

1. Metal packagings, including inner packagings of combination packagings and outer packagings of combination or composite packagings may only be used for packing methods OP7 and OP8;
2. In combination packagings, glass receptacles may only be used as inner packagings with a maximum content of 0.5 kg or 0.5 litre.
3. In combination packagings, cushioning materials shall not be readily combustible.
4. The packaging of an organic peroxide or self-reactive substance required to bear an "EXPLOSIVE" subsidiary risk label (Model No. 01) shall also comply with the provisions given in 4.1.3.10 and 4.1.3.11.

521	PACKING INSTRUCTION				521
Note: When consigning an organic peroxide in an IBC in accordance with this instruction, it is the responsibility of the consignor to ensure that the pressure and emergency relief devices installed on the IBC are designed to take appropriate account of the self-accelerating decomposition of the organic peroxide and of fire engulfment.					
UN No	**Organic peroxide**	**Type of IBC 1/**	**Maximum quantity (litres)**	**Control temp-erature 2/**	**Emergency temp-erature**
3109	**ORGANIC PEROXIDE, TYPE F, LIQUID**				
	tert-Butyl peroxyacetate, not more than 32% in diluent type A	31A 31HA1	1250 1000		
	tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32% in diluent type A	31A 31HA1	1250 1000		
	Cumyl hydroperoxide, not more than 90 % in diluent type A	31HA1	1250		
	Dibenzoyl peroxide, not more than 42 % as a stable dispersion	31H1	1000		
	Di-tert-butyl peroxide, not more than 32% in diluent type A	31A 31HA1	1250 1000		
	1,1-Di-(tert-butylperoxy) cyclohexane, not more than 42 % in diluent type A	31H1	1000		
	Dilauroyl peroxide, not more than 42%, stable dispersion, in water	31HA1	1000		
	Isopropyl cumyl hydroperoxide, not more than 72 % in diluent type A	31HA1	1250		
	p-Menthyl hydroperoxide, not more than 72 % in diluent type A	31HA1	1250		
	Peroxyacetic acid, stabilized, not more than 17 %	31H1 31HA1 31A	1500 1500 1500		

1/ See 7.5.3.4, bottom openings allowed.
2/ The temperatures are based on a non-insulated IBC.

The general packing provisions of Chapter 4.1 shall be met.

PARTICULAR PACKING PROVISIONS OR EXCEPTIONS:

To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency devices shall be designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of complete fire-engulfment (heat load 11 W/cm^2) or self accelerating decompression at the organic peroxide.

522 **PACKING INSTRUCTION** **522**

Note: When consigning an organic peroxide in an IBC in accordance with this instruction, it is the responsibility of the consignor to ensure that:

1. The pressure and emergency relief devices installed on the IBC are designed to take appropriate account of the self-accelerating decomposition of the organic peroxide and of fire engulfment; and

2. When applicable, the control and emergency temperatures indicated are appropriate, taking into account the design (e.g. insulation) of the IBC to be used.

UN No	Organic peroxide	Type of IBC 1/	Maximum quantity (litres)	Control temperature 2/	Emergency temperature
3119	**ORGANIC PEROXIDE, TYPE F, LIQUID, TEMPERATURE CONTROLLED**				
	tert-Butyl peroxy-2-ethylhexanoate, not more than 32% in diluent type B	31HA1	1000	+ 30 °C	+ 35 °C
		31A	1250	+ 30 °C	+ 35 °C
	tert-Butyl peroxypivalate, not more than 27% in diluent type B	31HA1	1000	+ 10 °C	+ 15 °C
		31A	1250	+ 10 °C	+ 15 °C
	Di-(4-tert-butylcyclohexyl) peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+ 30 °C	+ 35 °C
		31HA1	1000	+ 30 °C	+ 35 °C
	Dicetyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+ 15 °C	+ 25 °C
	Dimyristyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+ 10 °C	+ 15 °C
		31A	1250	+ 10 °C	+ 15 °C
	Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A				

1/ ***See 7.5.3.4, bottom openings allowed.***

2/ ***The temperatures are based on a non-insulated IBC.***

The general packing provisions of Chapter 4.1 shall be met.

PARTICULAR PACKING PROVISIONS OR EXCEPTIONS:

To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire-engulfment (heat load 11 W/cm^2) and/or self-accelerating decomposition.

"

4.1.6 Special packing provisions for Division 6.2

4.1.6.1 to 4.1.6.4 Text of 4.1.2.1 to 4.1.2.4 in ST/SG/AC.10/R.505/Add.4

4.1.6.5 Packing instructions 620 and 621

Packing instruction 620(b)(I), amend to read as follows:

"(I) Substances consigned at ambient temperatures or at a higher temperature. Primary receptacles shall be of glass..."

4.1.7 Add new text as follows:

"**4.1.7 Special packing provisions for Class 7**

4.17.1 Radioactive material, packagings and packages shall meet the relevant requirements of the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, in particular:

- the requirements for radioactive materials and for packagings and packages of Section VI (paras. 601-682);
- the test requirements of Section VII (paras. 701-737);
- the approval and administrative requirements of Section VIII (paras. 801-819, 827-830, 833-834).

4.1.7.2 The quantity of radioactive material in a package shall not exceed the limits specified in paras. 408 to 419 of the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1.

4.1.7.3 The relevant requirements of section V of the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1 shall be met, in particular:

- the requirements concerning the transport of other goods in a package (paras. 503-504);
- the requirements for transport of excepted packages (paras. 515-520);
- the requirements for transport of LSA material and SCO in industrial packages (paras. 521-522, 524-525);
- the limits on transport index, criticality index and radiation levels for packages (paras. 526-532);
- the assignment of categories (para. 533)."

4.1.8 Special packing provisions for dangerous goods other than self-reactive substances of Division 4.1 or than goods of Classes 1, 2, 7 or Divisions 5.2 or 6.2

(Reserved)

Chapter 4.2

Text as in ST/SG/AC.10/23/Add.3

PART 5

Text of ST/SG/AC.10/R.505/Add.5 with the following amendments:

Chapter 5.2

5.2.1.5 Add a new paragraph to read as follows:

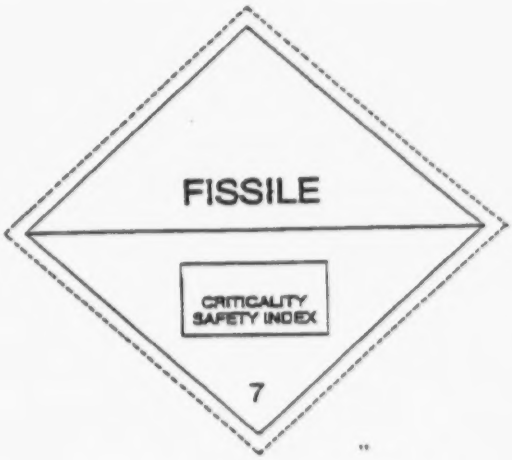
"5.2.1.5 Additional marking requirements are applicable for Class 7 material; refer to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, paras. 534-540."

5.2.2.2.1.6 Insert at the end of the first sentence:

"(refer to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, paras. 541-545 and 554, for the detailed provisions concerning the labeling for Class 7)."

5.2.2.2.2.1 Insert a new label for criticality safety index as follows:

"



"

(No 7E)
Class 7 fissile material
Background : White
Text (mandatory): black in upper half of label: "FISSILE"
In a black outlined box in the lower half of the label:
"CRITICALITY SAFETY INDEX"

Chapter 5.3

5.3.1.2.2 At the end of the paragraph, add:

"(Refer also to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No. ST-1, paras. 546 and 547, for the detailed provisions concerning the placarding for Class 7)".

Chapter 5.4

5.4.1.1.7 Insert a new sub-heading and paragraph to read as follows:

"5.4.1.1.7 *Special provisions for radioactive material : Particulars of consignment*"

Additional information is required for the carriage of radioactive material; refer to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, para. 549."

Renumber 5.4.1.1.7 to 5.4.1.1.10 as 5.4.1.1.8 to 5.4.1.1.11.

5.4.1.1.9 Insert a new sub-heading as follows:

"5.4.1.1.9 *Special provisions for empty uncleaned packages and tanks*"

5.4.1.1.10 At the end add:

"(Refer also to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No. ST-1, paras. 552 and 553 for Class 7)."

5.4.1.3.2 Replace the word "international" with "multimodal" and amend the end of the sentence to read:

", the use of documents of the form shown in 5.4.4 is considered advisable"

Amend footnote 1/ to read:

" 1/ *If used, the relevant recommendations of the UN/ECE Working Party on Facilitation of International Trade Procedures may be consulted, in particular Recommendation No.1 (United Nations Lay-out Key for Trade Documents) (ECE/TRADE/137, edition 81.11), Recommendation No.11 (Documentary Aspects of the International Transport of Dangerous Goods) ECE/TRADE/204, edition 96.1) and Recommendation No.22 (Lay-out Key for standard Consignment Instructions) (ECE/TRADE/168). Refer to the Trade Data Elements Directory, Volume III, Trade Facilitation Recommendations (ECE/TRADE/200) (United Nations publication Sales No.E.96.II.E.13).*

5.4.3.4 Insert a new sub-heading to read as follows:

"5.4.3.4 *Special documentation and prior notification for the carriage of radioactive material*

Special documentation and prior notification may be required for the carriage of radioactive material; refer to the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, paras. 555-561 and 801-834."

5.4.4 Add the following:

"5.4.4 Example of a form which may be used as a combined dangerous goods declaration and container packing certificate for multimodal transport of dangerous goods."

MULTIMODAL DANGEROUS GOODS FORM

1. Shipper / Consignor / Sender	2. Transport document number	
	3. Page 1 of Pages	4. Shippers reference
		5. Freight Forwarders reference
6. Consignee	7. Carrier (to be completed by the carrier)	
	SHIPPER'S DECLARATION I hereby declare that the contents of this consignment are fully and accurately described below by the proper shipping name, and are classified, packaged, marked and labelled / placarded and are in all respects in proper condition for transport according to the applicable international and national governmental regulations	
8. *This shipment is within the limitations prescribed for : (Delete non-applicable)* PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY	9. Additional handling information	
10. Vessel / flight no. and date	11. Port / place of loading	
12. Port / place of discharge	13. Destination	

14. Shipping marks	* Number and kind of packages; description of goods	Gross mass (kg)	Net mass	Cube (m3)

15. Container identification No./ vehicle registration No.	16. Seal number (s)	17. Container/vehicle size & type	18. Tare (kg)	19. Total gross mass (including Tare) (kg)

CONTAINER/VEHICLE PACKING CERTIFICATE
I hereby declare that the goods described above have been packed/ loaded into the container/vehicle identified above in accordance with the applicable provisions **.
MUST BE COMPLETED AND SIGNED FOR ALL CONTAINER/VEHICLE LOADS BY PERSON RESPONSIBLE FOR PACKING/LOADING

20. Name of company	Hauliers name	22. Name of company (OF SHIPPER PREPARING THIS NOTE)
Name / Status of declarant	Vehicle reg. no	Name/Status of declarant
Place and date	Signature and date	Place and date
Signature of declarant	DRIVER'S SIGNATURE	Signature of declarant

21 RECEIVING ORGANISATION RECEIPT
Received the above number of packages/containers/trailers in apparent good order and condition unless stated hereon: RECEIVING ORGANISATION REMARKS

* FOR DANGEROUS GOODS, you must specify: proper shipping name, hazard class, UN no., packing group (where assigned) and any other element of information required under applicable national and international regulations

** For the purposes of these Recommendations, see paragraph 5.4.2.1

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MULTIMODAL DANGEROUS GOODS FORM — Continuation Sheet

1. Shipper / Consignor / Sender	2. Transport document number	
	3. Page 2 of Pages	4. Shipper's reference
		5. Freight Forwarder's reference

14. Shipping marks	* Number and kind of packages; description of goods	Gross mass (kg)	Net mass	Cube (m3)

* FOR DANGEROUS GOODS: you must specify proper shipping name, hazard class, UN no., packing group (where assigned) and any other element of information required under applicable national and international regulations

BLACK HATCHINGS BLACK HATCHINGS BLACK HATCHINGS

PART 6 (to be renumbered Part 7)

Chapter 6.1 (to be renumbered Chapter 7.1)

Text of ST/SG/AC.10/R.505/Add.5 with the following amendments:

7.1.5.2.1 Add a new sub-heading as follows:

"**7.1.5.2.1 Responsibility of carrier**"

7.1.5.2.2 Add a new sub-heading as follows:

"**7.1.5.2.2 Action to be taken in the event of damage or leakage**"

7.1.6 Add a new section to read as follows:

"**7.1.6 Special provisions applicable to the carriage of radioactive material**

The relevant provisions of sections V and VIII of the Regulations for the Safe Transport of Radioactive Material (1996 Edition), IAEA Safety Standards Series No.ST-1, shall be met, in particular:

- the requirements before the first shipment (para. 501);
- the requirements before each shipment (para. 502);
- the requirements for the transport of other goods (paras. 503-506);
- the requirements and controls for contamination and for leaking packages (paras. 508-514);
- the requirements and controls for transport of excepted packages (paras. 515-520);
- the requirements and controls for transport of LSA material and SCO in industrial packages or unpackaged (paras. 521-525);
- determination of transport index (TI) (paras. 526-527);
- determination of criticality safety index (CSI) (paras. 528-529);
- limits on transport index, criticality safety index and radiation levels for packages and overpacks (paras. 530-532);
- transport and storage in transit (paras. 562-580);
- customs operations (para. 581);
- undeliverable consignments (para. 582).
- the requirement for approval of certain shipments (paras 802, 820, 824)."

PART 7 (to be renumbered Part 6)

Chapter 7.1 (to be renumbered Chapter 6.1)

Text of ST/SG/AC.10/R.505/Add.6 with the following amendments:

6.1.4.7.1 Delete the text in square brackets.

6.1.4.7.8 To be deleted, renumber the following paragraphs consequently.

Chapter 7.5 (to be renumbered Chapter 6.5)

Text of ST/SG/AC.10/R.505/Add.7.

Chapter 7.6 (to be renumbered Chapter 6.6)

See ST/SG/AC.10/23/Add.3.

Appendix A

LIST OF GENERIC OR N.O.S. PROPER SHIPPING NAMES

Text of ST/SG/AC.10/R.505/Add.9 to be amended as necessary in accordance with the amendments adopted for the List of Dangerous Goods in Chapter 3.2.

Appendix B

GLOSSARY OF TERMS

Text of ST/SG/AC.10/R.505/Add.9, with the addition of a new term as follows:

OXYGEN GENERATORS, CHEMICAL

Oxygen generators, chemical, are devices containing chemicals which upon activation release oxygen as a product of chemical reaction. Chemical oxygen generators are used for the generation of oxygen for respiratory support, e.g. in aircraft, submarines, spacecraft, bomb shelters and breathing apparatus. Oxidizing salts such as chlorates and perchlorates of lithium, sodium and potassium, which are used in chemical oxygen generators, evolve oxygen when heated. These salts are mixed (compounded) with a fuel, usually iron powder, to form a chlorate candle, which produces oxygen by continuous reaction. The fuel is used to generate heat by oxidation. Once the reaction begins, oxygen is released from the hot salt by thermal decomposition (a thermal shield is used around the generator). A portion of the oxygen reacts with the fuel to produce more heat which produces more oxygen, and so on. Initiation of the reaction can be achieved by a percussion device, friction device or electric wire.

INDEX

Text of ST/SG/AC.10/R.505/Add.9, to be amended as necessary in accordance with the amendments adopted for the List of Dangerous Goods in Chapter 3.2.